<div align="center">

Homework 10

Due: Friday, November 4

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1. [F]2.7.2

2. [F]2.8.1

3. [F]2.8.4

4. [F]2.8.5

5. Consider the function $f(x,y) = (x^2 - y)(2x^2 - y) = y^2 - 3x^2y + 2x^4$. Note that $f(0,0) = 0$.

   (a) Describe the sets

   $$S = \{(x,y) : f(x,y) > 0\}$$
   $$T = \{(x,y) : f(x,y) < 0\}$$

   (b) Show that for every straight line through the origin, $f > 0$ for some interval around the origin.

   (c) Nonetheless, show that every open neighborhood of the origin contains points (x,y) such that $f(x,y) < 0$.